

## REMARKS

This is intended as a full and complete response to the Office Action dated June 19, 2003, having a shortened statutory period for response set to expire on September 19, 2003. Please reconsider the claims pending in the application for reasons discussed below.

Claims 71-88 and 98-113 remain pending in the application and are shown above. Claims 1-70 and 88-97 have been canceled by Applicant. Claims 71-87 and 98-113 are rejected. Reconsideration of the rejected claims is requested for reasons presented below.

Claims 83-86 and 98-105 are rejected under 35 U.S.C. § 112, second paragraph. Applicant has amended claims 83-86 and 105 to replace the phrase "selected from the group of" with "selected from the group consisting of." Applicant has amended claims 98 and 103-105 to replace "flat panel" with "substrate" to clarify the claimed subject matter. Applicant submits that the changes made herein do not introduce new matter. Applicant respectfully requests withdrawal of the rejection of claims 83-86 and 98-105.

Claims 1-3, 6-8, 14, 18-19, 23, 27, 42-43, and 57-58 are rejected under 35 U.S.C. § 102(e) as being anticipated by *Shioda*, U.S. Patent No. 6,500,603. Applicant submits that the rejection of the claims is moot, as Applicant has canceled claims 1-3, 6-8, 14, 18-19, 23, 27, 42-43, and 57-58.

Claims 1, 4-8, 13-19, 22-25, 27-30, 32-35, 37-43, 58, 70, and 106-112 are rejected under 35 U.S.C. § 102(e) as being anticipated by *Xu, et al.* (U.S. Patent No. 6,306,563). Applicant submits that the rejection of claims 1, 4-8, 13-19, 22-25, 27-30, 32-35, 37-43, 58, and 70 is moot, as Applicant has canceled claims 1, 4-8, 13-19, 22-25, 27-30, 32-35, 37-43, 58, and 70. Regarding claims 106-112, the Examiner asserts that *Xu, et al.* teaches to cure the lower cladding, the core, and the upper cladding in situ following the deposition thereof. Applicant respectfully traverses the rejection.

*Xu, et al.* describes a curing step after each of the steps of depositing a lower cladding, a core, and an upper cladding. *Xu, et al.* describes curing by actinic radiation, such as with a lamp or laser, after depositing the lower cladding, a core, and an upper cladding by a spin coating type process (column 7, lines 56-61, column 23, line 49-column 24, line 13). *Xu, et al.* teaches that preferably, a mask is placed on each of the

lower cladding, core, and an upper cladding before the substrate is cured by actinic radiation. *Xu, et al.* provides an example in which a lower cladding is deposited on a substrate on a spin coater, placed in a purge box and exposed to actinic radiation, returned to the spin coater for the deposition of a core material, placed in a purge box and exposed to actinic radiation, and returned to the spin coater for the deposition of a lower cladding (column 33, lines 8-38). *Xu, et al.* does not teach, show, or suggest a method of forming an optical device on a substrate, comprising depositing one or more of a lower cladding, a core and an upper cladding and heat treating one or more of the lower cladding, the core and the upper cladding in situ (*i.e.*, without exposing the layer to atmosphere) following deposition thereof, as recited in claim 106. Applicant respectfully requests withdrawal of the rejection of claim 106, and of claims 107-112, which depend thereon.

Claims 20-21, 71-72, 74, 87, and 98 are rejected under 35 U.S.C. § 103(a) as being unpatentable over *Xu, et al.* Applicant submits that the rejection of claims 20-21 is moot, as Applicant has canceled claims 20-21.

Regarding claim 71, the Examiner states that it would have been obvious to modify *Xu, et al.* by using three different chambers to deposit the lower cladding, core layer, and the upper cladding because it would reduce processing time without cleaning the chambers for cross contamination between each step. Applicant respectfully traverses the rejection. As discussed above, *Xu, et al.* describes depositing a lower cladding, a core layer, and an upper cladding on one spin coater. *Xu, et al.* does not suggest or motivate depositing the lower cladding, core layer, and an upper cladding in different chambers. *Xu, et al.* does not teach, show, or suggest a method of fabricating multiple optical devices on a glass panel, comprising positioning a glass panel in a first processing chamber, depositing a lower cladding on the glass panel, densifying the deposited lower cladding, positioning the glass panel in a second processing chamber, depositing a core layer on the lower cladding, patterning and etching the core layer to define a pattern of optical devices, positioning the glass panel in a third processing chamber, and depositing an upper cladding over the patterned optical devices, as recited in claim 71. Applicant respectfully requests withdrawal of the rejection of claim 71 and of claims 72, 74, and 87, which depend thereon.

Regarding claim 87, the Examiner states that *Xu, et al.* teaches depositing and curing a lower cladding layer, and that he therefore interprets that the depositing and curing of the lower cladding layer of *Xu, et al.* are performed in the same system. Applicant submits that the Examiner has provided insufficient evidence to support his interpretation that the depositing and curing of the lower cladding layer of *Xu, et al.* are performed in the same system. Applicant respectfully requests withdrawal of the rejection of claim 87.

Regarding claim 98, *Xu, et al.* does not describe depositing a lower cladding in one chamber and a core layer in another chamber or treating a substrate in a densification chamber of a processing system that includes the lower cladding deposition chamber. *Xu, et al.* does not teach, show, or suggest a method for forming a portion of an optical device on a substrate, comprising positioning a substrate in a first deposition chamber on a processing system, depositing a lower cladding layer on the substrate, positioning the substrate in a densification chamber on the same processing system and treating the substrate therein, positioning the substrate in a second deposition chamber to deposit a core layer on the lower cladding layer, and then positioning the substrate in the densification chamber on the processing system and treating the substrate therein, as recited in claim 98. Applicant respectfully requests withdrawal of the rejection of claim 98.

Claims 9-11, 31, 60-69, 84-86, and 99-102 are rejected under 35 U.S.C. § 103(a) as being unpatentable over *Xu, et al.*, in view of *Nishimoto* (U.S. Patent 5,408,569). Applicant submits that the rejection of claims 9-11, 31, and 60-69 is moot, as Applicant has canceled claims 9-11, 31, and 60-69.

Regarding claims 84-86 and 99-102, Applicant submits that *Xu, et al.* in view of *Nishimoto* does not provide all of the limitations of claims 71 and 98, upon which claims 84-86 and 99-102 respectively depend. As discussed above, *Xu, et al.* does not provide all of the limitations of claims 71 and 98. *Nishimoto* describes methods of forming optical waveguides, but does not describe the apparatus used to form the layers of the wave guides. Thus, the combination of *Xu, et al.* and *Nishimoto* does not provide a process comprising positioning a glass panel in a first processing chamber, depositing a lower cladding on the glass panel, densifying the deposited lower cladding, positioning

the glass panel in a second processing chamber, depositing a core layer on the lower cladding, patterning and etching the core layer to define a pattern of optical devices, positioning the glass panel in a third processing chamber, and depositing an upper cladding over the patterned optical devices, as recited in claim 71. The combination of *Xu, et al.* and *Nishimoto* does not provide a process comprising positioning a substrate in a first deposition chamber on a processing system, depositing a lower cladding layer on the substrate, positioning the substrate in a densification chamber on the same processing system and treating the substrate therein, positioning the substrate in a second deposition chamber to deposit a core layer on the lower cladding layer, and then positioning the substrate in the densification chamber on the processing system and treating the substrate therein, as recited in claim 98. Applicant respectfully requests withdrawal of the rejection of claims 84-86 and 99-102.

Claims 12 and 36 are rejected under 35 U.S.C. § 103(a) as being unpatentable over *Xu, et al.* in view of *Ono, et al.* (U.S. Patent No. 6,553,164). Applicant submits that the rejection of claims 12 and 36 is moot, as Applicant has canceled claims 12 and 36.

Claims 26, 44-56, 59, 73-81, and 83 are rejected under 35 U.S.C. § 103(a) as being unpatentable over *Xu, et al.*, in view of *Veligdan, et al.* (U.S. Patent No. 6,222,971). Applicant submits that the rejection of claims 26, 44-56, and 59 is moot, as Applicant has canceled claims 26, 44-56, and 59.

Regarding claims 73-81 and 83, Applicant submits that *Xu, et al.* in view of *Veligdan, et al.* does not provide all of the limitations of claim 71, upon which claims 73-81 and 83 depend. As discussed above, *Xu, et al.* does not provide all of the limitations of claim 71. *Veligdan, et al.* describes methods of forming layers of an optical waveguide, including dip coating or bonding the layers (column 6, lines 1-23), but does not describe the apparatus used to deposit the layers. Thus, *Xu, et al.* in view of *Veligdan, et al.* does not teach, show, or suggest positioning a glass panel in a first processing chamber, depositing a lower cladding on the glass panel, densifying the deposited lower cladding, positioning the glass panel in a second processing chamber, depositing a core layer on the lower cladding, patterning and etching the core layer to define a pattern of optical devices, positioning the glass panel in a third processing chamber, and depositing an upper cladding over the patterned optical devices, as

recited in claim 71. Applicant respectfully requests withdrawal of the rejection of claims 73-81 and 83.

Claims 103-105 are rejected under 35 U.S.C. § 103(a) as being unpatentable over *Xu, et al.* and *Nishimoto*, further in view of *Veligdan*. As discussed above, Applicant submits that the combination of *Xu, et al.* and *Nishimoto* does not provide all of the limitations of claim 98, upon which claims 103-105 depend. Applicant further submits that *Xu, et al.* and *Nishimoto* in view of *Veligdan* does not provide all of the limitations of claim 98, as *Veligdan* does not describe densifying a cladding layer in a system which includes the chamber in which the cladding layer is deposited. Applicant respectfully requests withdrawal of the rejection of claims 103-105.

Claim 82 is rejected under 35 U.S.C. § 103(a) as being unpatentable over *Xu, et al.*, in view of *Gessel* (U.S. Patent No. 5,396,351). The Examiner states that it would have been obvious to modify *Xu, et al.* in view of *Gessel* by having a TFT panel because TFT panels exhibit high quality images with better contrast. Applicant respectfully traverses the rejection.

*Gessel* describes multilayer structures included a polarized fiber-optic layer for flat panel LCD screens. *Gessel* does not teach or suggest an apparatus or a sequence of chambers for depositing a lower cladding, a core layer, and an upper cladding. As discussed above, *Xu, et al.* does not provide a process comprising positioning a glass panel in a first processing chamber, depositing a lower cladding on the glass panel, densifying the deposited lower cladding, positioning the glass panel in a second processing chamber, depositing a core layer on the lower cladding, patterning and etching the core layer to define a pattern of optical devices, positioning the glass panel in a third processing chamber, and depositing an upper cladding over the patterned optical devices, as recited in claim 71. Applicant submits that *Xu, et al.*, in view of *Gessel* does not provide all of the limitations of claim 71, upon which claim 82 depends. Applicant respectfully requests withdrawal of the rejection of claim 82.

Claim 88 is rejected under 35 U.S.C. § 103 (a) as being unpatentable over *Xu, et al.*, in view of *Hornbeck, et al.* (U.S. Patent No. 6,282,358). Applicant submits that the rejection of claim 88 is moot, as Applicant has canceled claim 88.

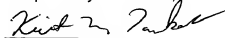
Claim 113 is rejected under 35 U.S.C. § 103(a) as being unpatentable over *Xu, et al.*, in view of *Veldhuis, et al.*, U.S. Patent No. (6,377,716). The Examiner states that it would have been obvious to modify *Xu, et al.* in view of *Veldhuis, et al.* by forming an encapsulating layer over the upper cladding because it will protect the upper cladding. Applicant respectfully traverses the rejection.

*Veldhuis, et al.* describes depositing and etching a SiON layer and then spin coating and curing a core polymer before depositing and curing a match polymer layer. *Veldhuis, et al.* does not describe the apparatus in which the layers are deposited and treated. As discussed above, *Xu, et al.* does not provide a process comprising positioning a substrate in a first deposition chamber on a processing system, depositing a lower cladding layer on the substrate, positioning the substrate in a densification chamber on the same processing system and treating the substrate therein, positioning the substrate in a second deposition chamber to deposit a core layer on the lower cladding layer, and then positioning the substrate in the densification chamber on the processing system and treating the substrate therein, as recited in claim 98. Thus, the combination of *Xu, et al.* and *Veldhuis, et al.* does not provide all of the limitations of claim 98, upon which claim 113 depends. Applicant respectfully requests withdrawal of the rejection of claim 113.

In conclusion, the references cited by the Examiner, alone or in combination, do not teach, show, or suggest the invention as claimed.

Having addressed all issues set out in the office action, Applicant respectfully submits that the claims are in condition for allowance and respectfully request that the claims be allowed.

Respectfully submitted,



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Keith M. Tackett

Registration No. 32,008

MOSER, PATTERSON & SHERIDAN, L.L.P.

3040 Post Oak Blvd. Suite 1500

Houston, TX 77056

Telephone: (713) 623-4844

Facsimile: (713) 623-4846

Agent for Applicant(s)